



US 20170170859A1

(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2017/0170859 A1**
(43) **Pub. Date: Jun. 15, 2017**(54) **ACCESSORY CASE FOR WIRELESS
ELECTRONIC DEVICE**(71) Applicant: **Apple Inc.**, Cupertino, CA (US)(72) Inventors: **Basim H. Noori**, San Jose, CA (US);
Khan M. Salam, Dublin, CA (US);
Matthew A. Mow, Los Altos, CA (US);
Yi Jiang, Sunnyvale, CA (US); **Yuehui
Ouyang**, Sunnyvale, CA (US)(73) Assignee: **Apple Inc.**, Cupertino, CA (US)(21) Appl. No.: **14/966,421**(22) Filed: **Dec. 11, 2015****Publication Classification**(51) **Int. Cl.**
H04B 1/3883 (2006.01)
H04B 7/06 (2006.01)
H02J 7/02 (2006.01)
H04B 1/3888 (2006.01)(52) **U.S. Cl.**CPC **H04B 1/3883** (2013.01); **H04B 1/3888**
(2013.01); **H04B 7/0617** (2013.01); **H02J**
7/025 (2013.01)(57) **ABSTRACT**

A removable case may have a body that is configured to receive an electronic device. The case may be coupled to the electronic device using wired and wireless paths. The case may include circuitry that receives wireless power from external equipment. The circuitry that receives the wireless power may receive wireless power at microwave frequencies. Received power may be supplied to the electronic device through wired and wireless paths. The removable case may also include circuitry that wirelessly communicates with external equipment. An array of antennas may be used to support beam steering. The array of antennas may support wireless communications in millimeter wave communications bands such as a communications band at **60 GHz** or other extremely high frequency communications bands. The case and electronic device may have respective intermediate frequency antenna structures to allow intermediate frequency signals to be wirelessly conveyed between the case and device.

